Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of Federal-State Joint Board on Universal Service	CC Docket No. 96-45

Comments on Joint Board Recommended Decision by Montana Public Service Commission, Montana Consumer Counsel, Vermont Public Service Board, and Vermont Department of Public Service

Martin Jacobson, Esq.
1701 Prospect Avenue, PO Box 202601
Helena, Montana 59620-2601
For the Montana Public Service Commission

Mary Wright, Esq.
616 Helena Avenue
Helena, Montana 59620-1703
For the Montana Consumer Counsel

Peter Bluhm, Esq.
112 State Street, Drawer 20
Montpelier, Vermont 05620-2701
For the Vermont Public Service Board

John Sayles Esq.,
112 State Street
Montpelier, Vermont 05602
For the Vermont Department of Public Service

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Summary of Argument

The Commission should reject the recommendations of the Joint Board because the Recommended Decision failed to perform the relevant analysis mandated by the Tenth Circuit Court of Appeals in *Qwest*. The Joint Board recommended continuation of the existing cost-based support system, but it failed to define "reasonable comparability" in the context of that program. The Joint Board also recommended continuation of the existing "benchmark" of 135 percent of national average costs among nonrural carriers. But the Joint Board also failed to explain how this decision will lead to sufficient federal support so that net costs in rural areas are reasonably comparable to urban costs. In both areas, the Joint Board failed to take the steps mandated by the *Qwest* Court. The Joint Board offered several rationales for recommending continuation of the 135 percent benchmark. All are flawed. First, the Joint Board invented a fictitious previous finding by the Commission that rates are already reasonably comparable. Second, the Joint Board relied on a General Accounting Office study that had serious methodological flaws and that actually showed the opposite of what the Joint Board concluded. While the GAO data do show that urban and rural national averages are comparable, that is irrelevant. The data also show that several rural areas, and particularly Vermont and Wyoming, have very high rates that are not comparable to urban areas.

The Joint Board also relied on statistical arguments. It reported a "cluster analysis" that it claims supports the existing 135 percent benchmark. In reality, the analysis was invalid and not rigorous. Moreover, it bases a permanent feature of the support system on transitory data; merely by shifting the data backward one year, cluster analysis supports a contrary conclusion and a lower benchmark. Even if valid, cluster analysis of the 2002 data supports a wide range of benchmarks, from which the Joint Board inexplicably selected one of the highest. For all these reasons the Joint Board's cluster analysis conclusions should be rejected.

The Joint Board relied upon "standard deviation" analysis. The Commission should reject the Joint Board's standard deviation analysis because each of the five premises underlying it is flawed, being at best unsupported and at worst clear error. The first premise, that section 254 was primarily designed to prevent prospective harm to consumers as rates change when competition develops, is used to justify the existing benchmark but it actually discredits the larger purpose of the program in which the benchmark is a mere component. The second premise, that local rates reported in the General Accounting Office Study reflect rates in 1996, is simply unsupported. The third premise, that 95 percent of the rates fall within two standard deviations of the mean, is statistically flawed for two separate reasons. The fourth premise, that two standard deviations above the mean is an appropriate point to set the benchmark because it identifies "true outliers," suffers from a variety of defects. It improperly relies on the distribution of cost data and thereby sets a new standard that is different from the statutory standard. It also misuses statistical variables in a way that amounts to bad science. The fifth and final premise, that two standard deviations above the mean "translates approximately" to a 135 percent benchmark should be rejected because the evidence of record actually supports adoption of a benchmark of 132 percent. We also append the supporting Statement of Dr. William Gillis.

The Joint Board recommends creation of a new "supplemental" support system based not on costs but on rates. But this cannot cure the known deficiencies of the Commission's cost-based support system, notwithstanding the Joint Board's creative use of language from the *Qwest* Court's decision. The Joint Board wants to equate rates with costs when support is calculated, but then deny that equation when it is time to explain how support complies with the statute.

The new system also has other defects. It improperly conditions sufficient federal support on state commissions filing petitions to request that support. Also, it apparently intends, improperly, to condition sufficient federal support on states taking specified action regarding the structure of their own local exchange rates. At minimum, this appears to require states to equalize rates within their own borders, but it may also require states to replace "implicit support" that takes the form of averaged rates. Finally, the new system is ill-defined, and gives petitioning states no guidance on how to adjust or normalize rates for the many significant variables that affect the value of a nominal local exchange rate.

The Commission should declare the national average urban cost under its cost model. Based on a variety of studies, including a new technique that involves use of "GIS" technology, the Rural State Commissions recommend an urban average cost of $17.89 per line per month. We also contend that "reasonable comparability" in the context of local exchange rates means that rates in high-cost areas cannot be more than 25 percent higher than urban costs. This means that the Commission should set a benchmark of $22.36, an amount that is 102 percent of the national average.

Contents

I. INTRODUCTION

On November 5, 2002, the commission released a Public Notice, DA 02-2976 (“Notice”) seeking comment on the Recommended Decision of the Universal Service Joint Board issued in response to the order of remand from the United States Court of Appeals for the Tenth Circuit. The following Rural State Commissions (technically, Montana Consumer Counsel is a state consumer advocate, not a state commission) hereby respectfully submit initial comments on the questions raised in that notice:

Montana Public Service Commission.

Vermont Public Service Board.

Vermont Department of Public Service.

Montana Consumer Counsel.

The above listed Rural State Commissions support the comments of the Maine Public Utilities Commission filed December 18, 2002 in this matter.

II. THE JOINT BOARD’S RECOMMENDATION VIOLATES THE ACT AND THE TENTH CIRCUIT COURT’S INSTRUCTIONS.

A. The Act and the Tenth Circuit Decision

The Act contains a list of principles upon which universal service support “shall” be based. Those principles create “mandatory duties” for the FCC. The Joint Board and the FCC must base their universal service policies on seven enumerated principles set forth in section 254(b) of the Telecommunications Act of 1996 (“the Act”). *See* 47 U.S.C. § 254(b). Two principles directly affect the matter under consideration here:

1) Consumers in "rural, insular, and high cost areas" should have access to services that are "reasonably comparable" to those provided in urban areas at "reasonably comparable" rates. *See* 47 U.S.C. § 254(b)(3).
2) "There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service." *See* 47 U.S.C. § 254(b)(5).

This language indicates a mandatory duty on the FCC. However, each of the principles in § 254(b) internally is phrased in terms of "should." This term indicates a recommended course of action, but does not by itself imply the obligation associated with "shall." Thus, the FCC must base its policies on the principles, but any particular principle can be trumped by another in the appropriate case. The FCC may exercise its discretion to balance the principles against one another when they conflict, but may not depart from them altogether to achieve some other goal.[1]

The other relevant provision of the Act is § 254(e), which provides in part that any federal support for universal service "should be explicit and sufficient to achieve the purposes of this section." *See*, 47 U.S.C. § 254(e). In this context, the word "should" has been held to create a mandatory duty.[2]

The Tenth Circuit decision, issued in July of 2001, remanded to the FCC its Ninth Order.[3] The Court directed the FCC to establish an adequate legal and factual basis for the Ninth Order and, if necessary, to reconsider the operative mechanism promulgated in that Order. The Court found four significant problems with the Ninth Order:

1) The FCC did not define adequately key terms including "reasonably comparable" and "sufficient."

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[1] *Qwest Corp. v. Federal Communications Commission*, 258 F.3d 1191, 1200 (10th Cir. 2001) (hereafter"*Qwest.")*

[2] *Texas Office of Pub. Util. Counsel (TOPUC) v. FCC*, 183 F.3d 393 (5th Cir. 1999), cert. dismissed sub nom. GTE Serv. Corp. v. FCC, 121 S.Ct. 423 (2000); *but see, Qwest, 258 F.3d 1191*.

[3] Ninth Report & Order and Eighteenth Order on Reconsideration, FCC 99-306, CC Docket No. 96-45 (Nov. 2, 1999) [hereinafter Ninth Order].

2) The FCC did not sufficiently justify setting the funding benchmark at 135percent of the national average.

3) The FCC did not provide any inducements for the state mechanisms that it concedes are necessary to implement universal service.

4) The FCC did not explain how this funding mechanism will interact with other universal-service programs.[4]

B. The Joint Board Recommendation Does Not Adequately Define Reasonable Comparability.

The Tenth Circuit examined "whether the FCC has endeavored to ensure that rates in rural and urban areas for universal services are reasonably comparable."[5] Finding that the terms were not adequately defined by the FCC, the Court noted the specific assertion made by Vermont and Montana, that under the comparability standard implicitly adopted by the FCC some rural "rates" would be 70 or 80 percent higher than urban rates.[6]

The Court rejected several earlier restatements by the FCC of the reasonably comparable standard such as "a fair range of urban/rural rates both within a state's borders, and among states nationwide" or "[S]upport levels . . . sufficient to prevent pressure from high costs and the development of competition from causing unreasonable increases in rates above current, affordable levels," or "[S]ome reasonable level above the national average forward-looking cost per line." The Court stated that these verbal reformulations merely "substitute different standards."[7] The Court directed the FCC to adopt a standard that would help to "answer the questions that arise about reasonable comparability."

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[4] *Qwest, supra.* at 1204, 1205.

[5] *Qwest, supra.* at 1201, 1202.

[6]*Qwest, supra.* at 1201. The Court was incorrect in this small matter. In reality, Vermont and Montana had asserted that rural *costs* after support would be 70-80percent higher than urban *costs*.

[7] *Qwest, supra.* at id

Instead of addressing the problem as required by the Court, the Joint Board took two detours around this central issue. The result is that "reasonably comparable" remains undefined. Without defining comparability, the Commission cannot find any given level of support is sufficient as is required by the Act.

The Recommended Decision explained in detail why support should continue to be based on costs, not rates.[8] If the Commission approves the Recommended Decision, support will continue to be primarily based on costs, and over $200 million of support per year will be distributed using the existing cost model.[9] The Rural State Commissions agree that, at least under limited circumstances, costs may indeed be substituted for rates.

But the Recommended Decision clarifies almost nothing about cost-based support. Having substituted costs for rates, the Joint Board should have done several things. It should have determined how to identify "urban" areas, so that an urban cost can be calculated.[10] It should also have explained how to decide when rural and urban *costs* are reasonably comparable. The recommended decision fails on both counts. Instead, the Joint Board stuck to the existing formula that relates high-cost areas to the national average cost, and it made no effort to relate national average cost to urban cost.

The only statutory term that the Joint Board does define is "sufficient." It recommends that sufficiency be defined "as enough support to enable states to achieve reasonably comparable

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[8] Recommended Decision ¶ 18.

[9] This existing cost-based support system will in 2002 provide approximately $232 million in support to nonrural companies.

[10] Oddly, the Joint Board *does* define high cost wire centers later, but only for purposes of the supplemental rate-based support system, discussed below. It recommends defining high cost as wire centers with 540 lines or less per square mile. ¶ 50. The Rural State Commissions fail to understand how this definition would affect anything in the supplemental support process described in ¶ 50 et.seq.

rates."[11] Curiously, the Joint Board's definition would have the effect of limiting the overall size of the universal service fund. This is a goal that the Joint Board has repeatedly pursued, but that is not in the list of statutory principles in section 254(b). Moreover, the Tenth Circuit has already admonished the Commission on similar past attempts to limit fund size.[12]

The Commission has broad discretion in the way it chooses to define the relationship between high-cost areas and urban areas.[13] Ultimately, however, there must be some way to compare the costs of rural, high-cost areas with urban low-cost areas. Many options are acceptable, but every option requires a definition of "urban." With that definition in hand, the Commission can plausibly explain the relationship between the net costs (after support) of high-cost states and the costs of low-cost urban areas.

The Joint Board has not defined when costs in high-cost areas are reasonably comparable to costs in low-cost urban areas. As a result, the Recommended Decision leaves intact nearly all the infirmities that the Court identified within the Ninth Order. For support based on costs, the Joint Board has still failed to "answer the questions that arise about reasonable comparability."[14]

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[11] Recommended decision ¶ 15.

[12] The Court stated that "Arguably § 254(b)(1) encompasses the principle that long-distance services, as well as universal services, should be kept affordable, and thus excessive subsidization of universal services by long distance may violate the principle found in § 254(b)(1). However, at most that means that the principles of universal service have to be balanced against the burden on long distance of providing contributions toward universal service." *Qwest* Supra at 1200

[13] This could be done directly by using a distribution mechanism that includes a benchmark that is a multiple of urban costs. Or, it could be done indirectly by keeping the benchmark that is related to average costs, but then defining the relationship between average costs and urban costs.

[14] The Recommended Decision explicitly discusses "reasonable comparability" only in the last major section that concerns the creation of a new supplemental rates-based support mechanism. Recommended Decision ¶ 50 et.seq. While it is certainly desirable to relate each support mechanism to the statutory goals in Section 254, a definition for a new rates-based supplemental mechanism does not solve the problem that the existing cost-based mechanism has no definition.

C. In Recommending Continuation of the 135 Percent Benchmark, The Joint Board Failed To Perform The Relevant Analysis.

The Tenth Circuit found in *Qwest* that the Commission inadequately explained how its 135 percent benchmark helps achieve the goal of reasonable comparability or sufficiency. The Court specifically notes that the FCC "substituted a comparison of national and statewide averages for the statutory comparison of urban and rural rates." The Court remanded the Commission's *Ninth Report and Order*. That order originally provides four justifications for the 135percent benchmark: (1) It "falls within the range recommended by the Joint Board," 115-150 percent; (2) such a level is "consistent with the precedent of the existing support mechanism," which uses a range of 115-160 percent; (3) that level is "near the midpoint" of the current range; and (4) it is a "reasonable compromise of commenters' proposals." The Court found these justifications insufficient to support the benchmark, and it emphasized the importance of the FCC using its expertise to set a proper benchmark. It stated that the FCC:

> is not a mediator whose job is to pick the 'midpoint' of a range or to come to a 'reasonable compromise' among competing positions. As an expert agency, its job is to make rational and informed decisions on the record before it in order to achieve the principles set by Congress. Merely identifying some range and then picking a compromise figure is not rational decision-making.[15]

The Court recognized that the FCC may have to select a point from a "narrow range," but it noted that range needs to be better identified and based on record data and that the range presented in the ninth order was too wide.[16] In summary, the Court found that the FCC had not shown that its choice was "informed and rational."[17]

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[15] *Id.* at 1202.

[16] *Id.* at 1202

[17] *Id.*

The Joint Board's Recommended Decision does not in any way solve this problem. The Joint Board offers three after-the-fact justifications for the 135 percent benchmark. However, even if those justifications were valid, which they are not, [18] they still do not address the issues defined by the Court. The Joint Board never collected or reported data concerning urban costs. Therefore, it had no empirical data from which it could derive a suitable benchmark from scratch, or even plausibly rationalize the 135 percent benchmark after the fact. As a result, there remains no factual basis to conclude that the existing 135 percent benchmark, when applied to the existing cost-based support system, will provide sufficient support to enable high cost states to have net costs that are reasonably comparable to urban areas.[19] The Joint Board simply failed to perform the required analysis.

III. THE JOINT BOARD'S RATIONALE FOR SUPPORTING THE 135 PERCENT BENCHMARK IS FATALLY FLAWED.

The Joint Board recommends that the existing 135 percent of average cost benchmark be continued. As the 2002 national average cost is $21.93 the Joint Board endorses a 2002 "dollar benchmark" of $29.61 (135 percent x $21.93). States with average costs below this dollar benchmark will receive no cost-based support.

A dollar benchmark that is too high produces harm for two classes of states. In the very highest cost states, too little support is provided. The net costs (after support) of high-cost carriers in those states necessarily remains too high, above a level reasonably comparable to the net costs of carriers serving urban areas. Second, states with somewhat lower cost receive no

[18] In the next section of these comments we evaluate the merits of each of these three justifications, and we conclude that each of them lacks merit.

support whatever, even though their costs are above the level that is reasonably comparable to urban areas.

The Joint Board provides three justifications for retaining the existing 135 percent benchmark: local exchange rate data; cluster analysis; and standard deviation analysis. Each of these justifications has fundamental flaws, and none of them support the majority's conclusion that the 135 percent benchmark should be retained. Furthermore, the analysis used by the Joint Board to reject the "urban benchmark" is fatally flawed.

A. Local Exchange Rate Data

The Joint Board relied upon two sets of facts concerning local exchange rates to justify the existing benchmark for cost-based support. The first was a reported prior finding in an earlier order. The second was a General Accounting Office study. As explained below, the Joint Board's use of each of these data sources is fundamentally flawed.

1. The Previous Finding of Comparability

In supporting its decision to maintain the 135 percent benchmark, the Recommended Decision asserts that the Seventh Report and Order had found that rates at that time were reasonably comparable.[20] However, an examination of that report reveals no such finding.

The *Seventh Report and Order* was issued in May of 1999[21] following the Joint Board's *Second Recommended Decision*, which had been issued in 1998.[22] The *Seventh Report and Order* made some broad decisions about the structure of the federal support program, but it was

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[19] We show below in Part V to VII that the evidence continues to show that the 135percent benchmark produces net costs that are not reasonably comparable.

[20] Recommended Decision ¶ 34 and footnote 83.

[21] *Federal-State Joint Board on Universal Service*, Seventh Report and Order, 14 FCC Rcd 8078 (1999) (hereafter "*Seventh Report and Order").*

an interim order, and it sought comment on a variety of detailed "methodological issues." The *Seventh Report and Order* did indeed find that "current rate levels are affordable."[23] But nowhere in the Seventh Report and Order is there a finding that rates were reasonably comparable. Moreover, nowhere in the Seventh Report and Order, or in any other prior Joint Board product, can one find that the Joint Board has collected any empirical data whatever on how rates vary across the country. So, there could not have been such a finding in the *Seventh Report and Order*. The Joint Board has now apparently invented an historical fact to support its predetermined conclusion that the 135 percent benchmark would not be changed.

2. The GAO Study

In concluding that rates are already reasonably comparable, the Joint Board also relied on a GAO study. As reported by the Joint Board, the study shows that "six years after passage of the Act the national averages of rural, suburban and urban rates for residential customers diverge by less than two percent." While the GAO report does indeed make an assertion about the difference of average rates, for several reasons that assertion is without probative value here.

The first problem with the GAO study is that it includes extraneous data. The GAO surveyed areas served by both rural telephone companies and areas served by nonrural telephone companies. Therefore, the GAO's conclusions apply to the country as a whole. But, the Commission's consideration here only concerns the rates of nonrural companies. This problem alone renders the GAO study meaningless.

It could be, for example, that rural customers served by nonrural companies have high rates, and rural customers served by rural companies have low rates. If so, excluding the

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[22] *Federal-State Joint Board on Universal Service*, Second Recommended Decision, 13 FCC Rcd 24744 (1998)

[23] *Seventh Report and Order*, ¶¶ 30, 38.

spurious data would lead to the opposite conclusion, tending to show that the benchmark should be lowered. Nothing in the GAO report or the Joint Board's Recommended Decision indicates that this possibility was examined.

The second problem with the GAO study is that it is under-inclusive. The GAO's conclusion about the similarity of rates applies only to residential rates. But section 254 speaks about rates generally, not just residential rates. Even if residential rates in urban and rural areas are equal, the same may not be true of business rates. The Joint Board did not explain how the rates of business customers vary from urban to rural areas, nor why it overlooked these customers.

The third problem with the Recommended Decision's use of the GAO study, and the most fundamental of all, is that it relies on an irrelevant conclusion. The Joint Board has relied on the small difference between the national average rate for urban areas and the national average rate for rural areas. Assuming for the sake of argument that rate patterns can be used to justify the benchmark, national averages have nothing to do with sufficiency of support. The problem does not concern the average, but the differences from the average. The question must be whether the rates in *any state* are so high as to be above a level of reasonable comparability with national urban rates. It is as though the Joint Board has found one person freezing in a snow bank and a second person sweating in a sauna and concluded that, on average, both are comfortable.

Inexplicably, although the Joint Board had the detailed GAO data before it, it failed to notice that those data actually show large rate differences from state to state. Verizon submitted a state-by-state analysis of the GAO data and has filed its findings in this proceeding.[24] Table 1. below shows a selection from Verizon's filing, consisting of six low-rate states and six high-rate states.

Table 1.

State Average Residential Rates								
Selected Low-Rate States					Selected High-Rate States			
State	Central City	Non-MSA	Suburb		State	Central City	Non-MSA	Suburb
Florida	$10.70	$9.26	$9.80		Maine	$16.91	$16.42	$16.48
Illinois	11.84	15.25	18.18		Montana	16.73	16.73	16.73
Missouri	10.06	9.91	10.06		Nebraska	17.83	17.72	17.50
Nevada	9.90	10.53	9.90		N. Dakota	17.69	16.60	17.69
New Jersey	7.94		7.70		Vermont	24.55	24.77	24.55
Texas	9.51	11.40	9.75		Wyoming	23.10	37.55	23.10

Among these selected low-rate states, not one has central city residential rates above $12 per month. But among the high-rate states, not one has non-MSA rates below $16. Vermont's rate is above $24, and Wyoming's rate is $37.55. Inexplicably, the Joint Board apparently failed to notice these important facts from the GAO study.

The GAO's expertise is not telecommunications, and its report has several methodological problems that may be attributed to unfamiliarity with the complexities of local exchange rates. The sample size used in the study was too small to be statistically valid for any state. Second, the GAO overlooked some kinds of local exchange charges that must be paid by

[24] Letter from W. Scott Randolph, Director – Regulatory Affairs for Verizon Communications, to Marlene H. Dortch, Federal Communications Commission, dated June 26, 2002, CC Docket 96-45, (Verizon June 26 ex parte),

all end users in some states but not all states. Third, the study's unadjusted rate data ignored the fact that local rates in some places buy more services and broader local calling scope than in others. It also ignored the fact that some high-cost states have established high access and toll rates in order to keep local exchange rates moderate. Fourth, in areas where more than one local calling area is offered, the GAO did not even pick consistent rates. For example, in Michigan the study reported the local rate as $49 per month, but a footnote shows that the most common rate is $12. For all these reasons, the GAO data have not been shown to be sufficiently meaningful and reliable to support relevant inferences here.

In summary, the Recommended Decision is based on a GAO report that includes data irrelevant to the issue in evaluating the benchmark, that includes data that are both over-inclusive and under-inclusive, and that is methodologically flawed. Moreover, the Joint Board inexplicably relied on an irrelevant comparison of national averages and overlooked the real import of that data, that rural rates in some areas are too high to be reasonably comparable to urban areas. At minimum the Commission should disregard the GAO study. At best, the Commission should consider the GAO study to provide evidence for the need to increase federal support.

B. Cluster Analysis

The Joint Board found that the 135 percent benchmark was "empirically supported by cluster analysis." Cluster analysis, it explains, is "an analytical technique that organizes information around variables so that relatively homogeneous groups, or clusters, can be identified." The Joint Board has identified some states with similar cost characteristics. It has, for example, noted that Kentucky, Maine, Alabama, Vermont, Montana, West Virginia and

Attachment 1.

Wyoming, when placed in cost order, do not have significant cost gaps from one state to another.[25] The Joint Board then concludes that cluster analysis supports the current 135 percent benchmark because "cluster analysis identifies a high-cost, rural cluster of states that matches the group of states currently receiving support under the non-rural high-cost support mechanism.

The Joint Board has in fact found the largest cost gap in the ranked list of the states. But the fundamental problem is that the pattern of costs among the states is irrelevant to the sufficiency of support. The Joint Board's use of cluster analysis provides absolutely no insights into the larger question of what comprises comparable rates. The statute does not direct the FCC to provide support to the states that happen to group at the high end of the cost distribution. Rather, it directs the FCC to provide sufficient support so that rates in high cost areas may be reasonably comparable to costs in urban areas. Since the Commission has equated costs with rates, section 254 should be read to direct the Commission to provide sufficient support so that *net costs* in high cost areas may be reasonably comparable to those in urban areas.

The Joint Board's conclusion is illogical. At most, the cluster analysis shows that a group of states getting support in 2002 (except for Mississippi) have similar cost characteristics. But this says nothing about whether the support received by those states was sufficient to achieve reasonably comparable net costs.[26] The Joint Board found the largest cost gap, but it erred in assuming that states above the gap need support and states below the gap do not need support.

We also note that the Joint Board's cluster analysis was not statistically rigorous. Cluster analysis normally adjusts the boundaries of subgroups in a population until some statistic, such as the difference of the means, is maximized. The task essentially is to adjust group definitions

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[25] Recommended Decision ¶ 37.

[26] Nor can it show that comparatively high-cost states that did not receive support have reasonably comparable net costs.

so that the resulting groups are the most different from each other. But the Joint Board did not do that kind of rigorous analyses. Rather, it simply looked for the largest gap in the ranked list of state costs, and then attributed policy significance to that fact, concluding that all states on one side of the line should get support and all on the other should not.

Even assuming for the sake of argument that cluster analysis could have some probative value, the Joint Board has attempted to justify a permanent feature of the support system based upon data that are very likely to change. The 135 percent benchmark is a fixed parameter that is permanently codified in rule. Yet each year the states' costs move up and down.[27] When cost data are volatile, the premise underlying the Joint Board's benchmark recommendation could easily become factually inaccurate.[28]

This is not just a theoretical problem. When cluster analysis is applied to the data from only one year earlier it argues for lowering the 135 percent benchmark. In 2001, the cost gap between Nebraska and Kentucky was larger than it was this year.[29] Cluster analysis therefore would conclude even more confidently in 2001 that Nebraska should receive no support and Kentucky should receive support. But in 2001, as it happened, neither Kentucky nor Nebraska received support. In other words, the logic of the Recommended Decision, applied to 2001 data, would have shown that Kentucky was not receiving sufficient support and that the benchmark should be lower than 135 percent.

The final problem with cluster analysis is that it does not provide a unique solution. If the cluster analysis were probative, then the benchmark should be set so that Kentucky (and

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[27] Between the 2001 and 2002 support years, 36 of 52 jurisdictions saw their average cost change by $0.50 or more, and18 saw their average cost change by $1.00 or more.

[28] It might be true, for example, that next year Nebraska's cost increases by $0.50 and Kentucky's cost decreases by $0.50. In that even, the gap between these two states would no longer be remarkable and the Joint Board's conclusion would be based on a factually inaccurate premise.

higher cost states) receive support while lower cost states (e.g., Nebraska) do not. However, that outcome can be achieved in 2002 by selecting a benchmark as low as 129 percent or as high as 135.5 percent. The Joint Board did not explain why cluster analysis supports a benchmark of exactly 135 percent any more than it supports a benchmark of 129 percent. The latter choice would increase support to every state now receiving support by $1.00 per line per month.[30] Failure to explain such a material difference in support is arbitrary.

In summary, the Joint Board used cluster analysis to support retention of the existing 135 percent benchmark even though the analysis is irrelevant to sufficiency and reasonable comparability. Assuming its validity for the sake of argument, the Joint Board's cluster analysis was primitive and attributed inappropriate significance to apparently transient cost differences. Finally, to the extent that it is a rigorous analytical tool, it does not even produce a unique benchmark solution, and the analysis supports increasing support as much as it supports the status quo. The Commission should reject the Joint Board's cluster analysis.

C. Standard Deviation Analysis

The Joint Board's third argument for the 135 percent benchmark was a "standard deviation analysis." This argument, suggested by Verizon, is based on five premises or calculations. For clarity, these steps are set out here and then are discussed below in order.

1. The range of rates at the time the Act passed in 1996 was reasonably comparable and that section 254 was primarily designed to prevent prospective harm to consumers as rates change when competition develops.

2. Local rates reported in the General Accounting Office Study reflect rates in effect at the time the Act passed and can be used to ascertain the distribution of rates in effect in 1996.

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[29] The gap in that year was $2.12 rather than $1.58.

[30] A benchmark of 129 percent is 6 percent lower than 135 percent. The current national average cost is $21.93. The support reduction for each carrier already receiving support would be $21.93 x .06 x .76 = $1.00.

3. 95 percent of the rates fall within two "standard deviations" of the mean.

4. Two standard deviations above the mean is an appropriate point to set the cost benchmark because it identifies "true outliers."[31]

5. Two standard deviations above the mean "translates approximately" to a 135 percent cost benchmark.[32]

1. Purpose of Section 254

The first of the Joint Board's premises was that the range of rates at the time the Act passed in 1996 was reasonably comparable and that section 254 was primarily designed to prevent prospective harm to consumers as rates change when competition develops.[33] The Joint Board cautiously observed that prospective harm to reasonably comparable rates was "one of the goals" of the 1996 Act.[34] However, since the Joint Board also adopted standard deviation analysis as one argument supporting the 135 percent benchmark, the Rural State Commissions assume the Joint Board must have broadly accepted this premise -- that the rates in 1996 were reasonably comparable -- even though the Joint Board never explained its criterion for accepting it.

The Rural State Commissions agree that *one* of the purposes behind section 254 was to protect ratepayers prospectively from harm arising after the Act passed. But the Joint Board erred in assuming that only this form of harm was anticipated. When the Act passed, Congress anticipated that competition might jeopardize two kinds of implicit support. First, it was thought that competition would force business local exchange rates down and residential local exchange rates up. Second, it was thought that competition would force urban local exchange rates down

[31] Recommended Decision ¶ 36.

[32] Recommended Decision ¶ 35.

[33] Actually, the Recommended Decision cautiously gave this "prospective harm" concept only a lukewarm endorsement.

and rural local exchange rates up. But all of these changes are *intrastate* rate changes, and states have primary responsibility and ability to manage intrastate rate changes. To remove any doubt about this, the Act gave the states authority to enact their own universal service programs.[35]

But the existing forward-looking federal support program is designed to address a completely different kind of harm. The Joint Board and the Commission have repeatedly observed that the purpose of support to nonrural carriers is to address cost differences *among states* and that cost and rate differences within states are primarily the responsibility of the states themselves.[36] The federal fund is designed to take care of cost differences that are beyond any individual state's ability to remedy.

For this reason the first premise of standard deviation analysis is inconsistent with the design of the very program it has been drafted to defend. If the Joint Board is correct, and if the only goal was to remedy prospective harm, then Congress's only perceived interest was to prevent *intrastate* de-averaging, and there was no need for section 254 to authorize a federal universal service program that moves money *among* states. Since the existing support programs aim at state-to-state cost differences that in large part predated 1996, the Joint Board would apparently conclude that these programs are beyond the intention of Congress.

The Joint Board apparently did not appreciate the irony that the argument it used to defend the existing system is fundamentally at odds with its underlying purpose. The

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[34] Recommended Decision ¶ 35.

[35] 47 U.S.C. § 254(f).

[36] *E.g. Seventh Report and Order* ¶ 31. ("Specifically, the Joint Board's proposed methodology will ensure that any state with per-line costs substantially above the nationwide average will receive federal support for those intrastate costs, unless the state has the ability to maintain reasonably comparable rates without such support. States, of course, retain primary responsibility for local rate design policy and, as such, bear the responsibility to marshall state and federal support resources to achieve reasonable comparability of rates.")

Commission should reject the Joint Board's first premise underlying the standard deviation analysis because it narrows and distorts the purpose of section 254.

2. Data About 1996 Rates

The second of the Joint Board's premises was that Local rates reported in the General Accounting Office Study reflect rates in effect at the time the Act passed and can be used to ascertain the distribution of rates in effect in 1996. The Joint Board makes this conclusion apparently with no proof beyond Verizon's assertion "that rates have not changed substantially since 1996."[37] The Commission should reject the second premise because it is not based upon substantial credible evidence.

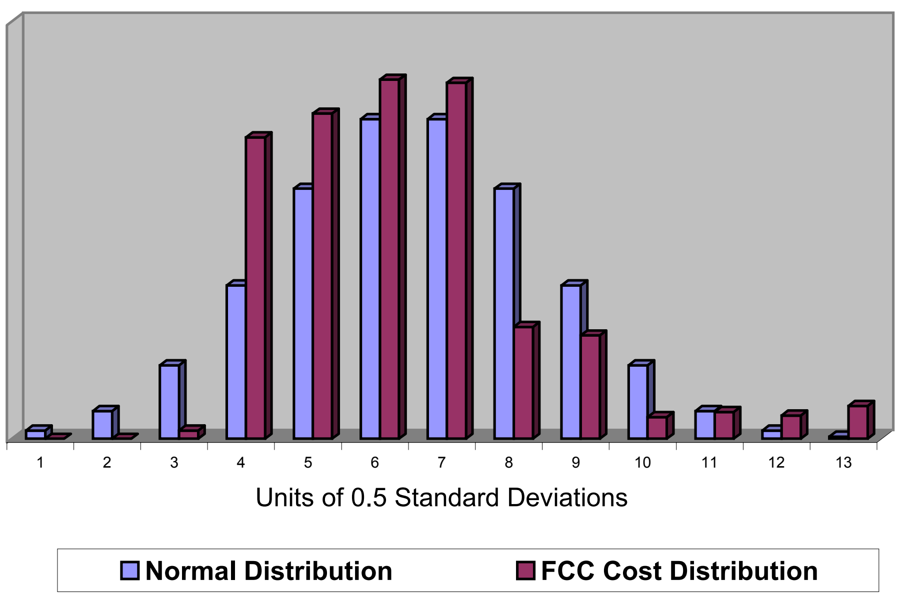
3. Statistics and Standard Deviations

The third of the Joint Board's premises was that 95 percent of rates fall within two "standard deviations" of the mean. As Verizon stated it in its ex parte presentation, " . . . the vast majority of rates fall within two standard deviations of the mean (i.e., a 95percent confidence interval) . . . ." The Joint Board apparently thought that if it set the benchmark at 135 percent of the national average cost, about five percent of the cases would receive support. Verizon and the Joint Board are mistaken for two different reasons.

First, Verizon and the Joint Board assumed that rates in the GAO study are normally distributed. But the Joint Board did not test this question. If rates and costs are not normally distributed, 95 percent of the cases may not lie within two standard deviations. Without evidence that rates follow a normal distribution, the Joint Board's factual premise is statistically invalid. Apparently the Joint Board had no legitimate statistical basis to draw any conclusions about how many cases to expect above the two standard deviation boundary.

Figure 1 shows visually that the distribution of costs under the FCC model is quite different from the distribution of probabilities under a normal curve. The FCC Cost curve has less than the expected number of lines with very low costs, but more than expected lines at the mean and just below it. In the upper half of the distribution, the cost values drop off quickly, but they extend much further out than the normal distribution, with a significant number of cases exceeding 3 standard deviations. Figure 1 demonstrates visually that cost data are not normally distributed. Therefore, even if one overlooks the one-tail problem, the Joint Board incorrectly applied statistical principles applicable to normal distributions when it concluded that 95 percent of the cases fall within two standard deviations.

Figure 1. The Normal Distribution and the FCC Cost Distribution



Verizon and the Joint Board have also made a different statistical error. Even assuming for the sake of argument that costs were distributed normally, the Joint Board overstates the percentage of high-cost cases that would fall more than two standard deviations above the mean.

[37] Recommended Decision ¶ 35.

It is true that approximately five percent of the cases in a normal distribution are more than two standard deviations away from the mean (actually 4.6 percent). But half of these cases are in the low value "tail" on the curve and the other half are in the high value "tail" on the curve. Verizon and the Joint Board simply assumed that a two-tailed analysis was appropriate.

A "two-tail" analysis is statistically appropriate where the question concerns both high and low cases. So, for example, one might be interested in knowing the percentage of manufactured parts that weigh more than two standard deviations above the mean or less than two standard deviations below the mean. But here we are concerned as a policy matter only with states that have *high* rates or costs and not at all with how many states have very low rates or costs. Therefore, a "one-tailed" analysis is appropriate here, and one would expect only 2.3 percent of a normally distributed population to have costs or rates *above* two standard deviations.[38] The standard deviation analysis used by the Joint Board, applied to a normal distribution, would produce support for less than half of the cases that the Joint Board assumed. Thus the Joint Board's conclusion is based on clear error and should be disregarded.

In summary, the Commission should reject the Joint Board's third premise because it relied on two incorrect but significant facts: that the distribution of rates follows a "normal" distribution; and that five percent of the cases fall above two standard deviations in a normal distribution.

4. Setting the Benchmark With a Statistical Yardstick

The fourth of the Joint Board's premises was that a point defined as two standard deviations above the mean is an appropriate point to set the benchmark because it identifies "true

[38] In a large normal or "z" distribution, the probability of a case falling between 0 and plus 2 standard deviations is 0.4772. This means that the probability of a case falling above 2 standard deviations is 1 – 0.5 – 0.4772 = 0.0228 or 2.28 percent.

outliers." The Rural State Commissions disagree with this conclusion on policy grounds, and we also reject it because it makes a false claim to scientific exactness.

The fundamental problem is the same one identified with cluster analysis: irrelevancy. Standard deviation analysis relies on the patterns of costs among the states. Here that pattern is expressed in statistical terms of means and standard deviations, not as gaps between state costs in a ranked list. But the fundamental problem is the same. The pattern of costs among the states is irrelevant to the sufficiency of support provided to those states. Knowing that a state has costs that are higher or lower than plus two standard deviations simply says nothing about whether its costs are reasonably comparable to urban.

The 135 percent benchmark and the two standard deviation benchmark are equally arbitrary. The existing problem is that there is no reason to believe that costs less than 135 percent of the national average are reasonably comparable to urban areas. This problem is not solved by making the new assumption that costs two standard deviations above the mean are reasonably comparable to urban areas. As further explained in the attached statement from Dr. Gillis, a benchmark setting at two standard deviations above the mean is no less arbitrary than the 135 percent benchmark to which it supposedly lends aid.

Once again, the Joint Board is suggesting a new and different formulation of the statutory language. The Court has already rejected several other reformulations. Here the Joint Board would substitute a new test that only states that are "truly outliers" should receive support.[39] This alters the standard in section 254. The Act does not direct the Commission to provide support to outliers, but to states that have costs that are not "reasonably comparable" to urban

[39] Recommended Decision ¶ 36.

areas. Once again, rather than clarifying a statutory term, the Joint Board has chosen to create a new standard that differs from the statute.

Verizon and the Joint Board have suggested that because this method uses a common statistical yardstick it is more scientific or reliably mathematical than the bare 135percent benchmark. The Commission should not be seduced by the fact that the standard deviation analysis is garbed in scientific clothing. Although the analysis is expressed in statistical terms, it has no statistical validity. The attached statement from Dr. Gillis discusses this point in detail.

Standard deviation analysis is a tool used in statistical hypothesis testing. Hypothesis testing and standard deviation analysis are the right tools for certain types of problems, such as deciding whether the mean value of a sample is significantly different from the mean value of a population or whether two samples may derive from the same population. In instances where data are normally distributed, there is a definite relationship between the number of standard deviations between two means and a confidence level. For example, if a sample mean differs from the population mean by more than two standard deviations, then it is acceptable to say that the means are statistically different, with a "confidence level" of 95 percent. This means that in a large number of cases where we conclude that there is a significant difference (and the "null hypothesis" is false), we would expect our conclusion to be correct 95 percent of the time and incorrect 5 percent of the time.

This kind of statistical inference is also in common use by regulatory agencies that must evaluate the relative quality of wholesale services provided by incumbent telephone companies.[40] This kind of analysis is also standard practice within the scientific and economic communities.

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[40] For example, the Commission has approved the 95 percent confidence interval in evaluating the sensitivity of Verizon's performance measures of when it is providing wholesale services to its competitors. Application by

The issue presently before the Commission, however, is not a problem for which hypothesis testing and standard deviation analysis is appropriate. In applying standard deviation analysis via a 95 percent confidence interval, the Joint Board has inappropriately applied the science of statistical inference.

Under some circumstances standard deviation analysis may be appropriate, but a different confidence interval may be proper. In those cases, one should not use two standard deviations as the test criterion. The appropriate confidence interval depends upon the risks and benefits of false positive errors and false negative errors.[41] Different circumstances call for different standards of confidence. One, two and three standard deviations each has an associated confidence level, and each has been used by the scientific community. The Commission should not assume that 2.0 standard deviations is an unvarying norm within either the regulatory[42] or the scientific communities. Unfortunately, the Joint Board did not explain clearly why 2.0 standard deviations is the appropriate standard to apply to the "reasonably comparable" language of section 254.

Although garbed in statistical language, the Joint Board's analysis is statistically meaningless. It is bad science and should be disregarded.

Verizon New England Inc. for Authorization To Provide In-Region InterLATA Services in Vermont, CC Docket No. 02-7, Order released April 17, 2002, footnote 267.

[41] For example, if a drug has severe side effects, the FDA might want to require a 99 percent confidence level of the drug's effectiveness before allowing it to reach the market. Conversely, if a diagnostic test is cheap, reliable and harmless, it may be appropriate to administer the test to a broad population even though there is only a 1 percent confidence level that a particular individual receiving the test is actually ill.

[42] In analyzing the reasonableness of collocation costs, the FCC found in 1997 that 1.0 standard deviations provided sufficient confidence. *In the Matter of Local Exchange Carriers' Rates, Terms, and Conditions for Expanded Interconnection Through Physical Collocation for Special Access and Switched Transport*, CC Docket No. 93-162, Second Report and Order, released June 13, 1997 ¶ 125.

5. The 135 Percent Benchmark

The fifth of the Joint Board's premises was that a point two standard deviations above the mean "translates approximately" to a 135 percent benchmark. This is less than the complete truth.

Verizon's calculation was based on the original 2000 cost model outputs. Verizon calculated the national average cost at $23.35 and the standard deviation at $3.74. Using this data, the threshold point (two standard deviations above the mean) is $30.83 (= $23.35 + (2 x $3.74)). This is 132.03 percent of the national average. Therefore, Verizon's analysis actually supported a percentage benchmark of 132.03 percent , not 135 percent.

Without explanation, the Joint Board recommends a benchmark of 135 percent. The difference is substantial. With a benchmark of 132 percent, every state that receives support would receive approximately an additional $0.50 of support per month per line.[43]

The Commission should reject the Joint Board's standard deviation analysis because it arbitrarily fails to explain why it selected a benchmark of 135 percent when the evidence supported a benchmark of 132 percent.

6. Conclusion

The Commission should reject the Joint Board's standard deviation analysis because each of the five premises underlying it is flawed, being at best unsupported and at worst clear error. The first premise, that section 254 was primarily designed to prevent prospective harm to consumers as rates change when competition develops, is used to justify the existing benchmark but it actually discredits the larger purpose of the program in which the benchmark is a mere

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[43] A benchmark of 132 percent is 3 percent lower than 135 percent. The current national average cost is $21.93. The support reduction for each carrier already receiving support would be $21.93 x .03 x .76 = $0.50. Also, with a

component. The second premise, that local rates reported in the General Accounting Office Study reflect rates in 1996, is simply unsupported. The third premise, that 95 percent of the rates fall within two standard deviations of the mean, is statistically flawed for two separate reasons. The fourth premise, that two standard deviations above the mean is an appropriate point to set the benchmark because it identifies "true outliers," suffers from a variety of defects. It improperly relies on the distribution of cost data and thereby sets a new standard that is different from the statutory standard. It also misuses statistical variables in a way that amounts to bad science. The fifth and final premise, that two standard deviations above the mean "translates approximately" to a 135 percent benchmark should be rejected because the evidence of record actually supports adoption of a benchmark of 132 percent.

D. The Joint Board and the "Urban Benchmark"

In recommending continuation of the 135percent benchmark, the Joint Board also explicitly rejected the concept of establishing an "urban benchmark." That is, it rejected the idea that the support benchmark should be stated as a multiple of the national average *urban* cost. The Joint Board did acknowledge that the record shows that a percentage benchmark set at 135 percent of national average is the same as a benchmark set at 165 percent of the national urban average. This, it acknowledges, is perilously close to the 170 percent that the Tenth Circuit criticized, but the Joint Board nevertheless supports continuation of this status quo. The Joint Board's reasoning is unpersuasive and is contrary to applicable law as established by the 10th Circuit.

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benchmark of 132 percent, some states might for the first time become eligible for support. Per line support for such states would be less than $0.50 per month.

The Joint Board's first argument is that "rates do not necessarily equate to costs."[44] The Rural State Commissions find this a contradictory argument to make in support of the benchmark for a cost-based support system. Apparently the Joint Board not only chooses to reject the fundamental equation that makes cost-based support possible in the first instance, but it then rejects any effort to apply logic to the design of that cost-based system so that it may comply with the Act. The Joint Board wants to say "rates equal costs" for support, but then also say that "rates do not equal costs" for accountability. The Rural State Commissions maintain that if support is to be cost-based, the Commission must design that system so that, as it explained in the *Seventh Order*, *"cost levels net of support"* in rural areas are reasonably comparable to urban areas.

The Joint Board also relied on a second argument to reject the "urban benchmark." It implicitly acknowledged that if it adopted an urban benchmark but kept everything else constant, the current system would have a benchmark of 165 percent of urban cost, and this would probably be too high a number to be plausible under the Act. The Joint Board's discussion is quite transparent in disclosing that the true motive was to avoid increasing the total amount of support. Explaining its reluctance, the Joint Board asserted that nobody had explained to it "how additional funding produced by an urban benchmark would produce reasonably comparable rates."[45]

This is an odd argument to use in support of the status quo. The Joint Board recommends continuation without change of the existing system of support that provides over $200 million of support to carriers in eight states. Yet it somehow concludes that providing any additional support under that same system would not make rural rates more comparable to urban rates and

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[44] Recommended Decision ¶ 41.

would have no benefit to customers. One is left to wonder why the Joint Board continues to support the 135 percent benchmark that produces over $200 million of support. The Joint Board seems unaware of and unconcerned by the obvious contradiction.[46]

The Recommended Decision imposes an improper burden on the Rural State Commissions. High-cost states should not be burdened to show that increased high-cost support, required by the statute, will be well spent. It is enough to show that the statute requires it. The Joint Board's attitude is particularly problematic since control of how the money is spent is largely in the control of the Commission, not the high-cost states. If the Commission has concerns with how support is being applied by the recipient carriers, the Congress gave it tools to address this problem. Rather than withhold support that is needed in high-cost states and required under the Act, the Commission should strengthen the certification requirements it now imposes under subsection 254(e).

IV. A NEW RATES-BASED SUPPLEMENTAL SUPPORT MECHANISM WOULD NOT SOLVE THE INFIRMITIES OF THE PRESENT SYSTEM

The Joint Board proposed an entirely new but poorly defined supplemental process for awarding supplemental support. Although it previously found that costs are a superior basis for support than rates in the same decision document, the Joint Board later recommended a new "supplemental" system be based on rates.[47] This will allow a state to apply for "federal action,"

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[45] Recommended Decision ¶ 40.

[46] The Joint Board also stated that proponents have not provided it with a "rational justification for setting the benchmark at any particular level. Apparently this is an evaluation that information submitted by Rural State Commissions was not "rational." Several state commissions filed comments in this proceeding advocating the adoption of a benchmark at not more than 125percent of urban cost. Initial Comments by Maine Public Service Commission, Montana Public Service Commission, and Vermont Public Service Board, filed April 10, 2002.

[47] Recommended Decision ¶ 43 et.seq.

possibly including "additional targeted federal support." But first the state must persuade the FCC that it has "already taken all actions reasonably possible and used all available state and federal resources to make basic service rates reasonably comparable, but that rates nevertheless fall above the [FCC's] benchmark." Also, the state must "submit rate data in support of its certification, based on a basic service rate template."[48]

In the abstract, the Rural State Commissions do not oppose the creation of a new supplemental mechanism to provide additional support to areas with exceptional circumstances. This may be useful in limited circumstances such as during periods of recovery from natural disasters. However, the Rural State Commissions do object to the mechanism proposed here, primarily because the proposed mechanism is not an adequate response to the Tenth Circuit Court's ruling, and secondarily because the mechanism is not well defined.

A. Facts About Rates Cannot Show That Cost-Based Support Is Sufficient.

The Recommended Decision repeatedly emphasized rates, and expresses doubt that "an urban **cost** benchmark would better satisfy the statutory comparison of urban and rural **rates**."[49] It appears that the Joint Board concluded that so long as a state's rates are reasonably comparable to urban rates, section 254 has been satisfied.[50] In other words, the Joint Board believes that the Commission can refrain from offering a coherent rationale for its cost-based support system so long as each of the states passes a "final rate results" test.

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[48] Recommended Decision ¶ 50.

[49] Recommended Decision ¶ 39 (emphasis in original).

[50] Recommended Decision ¶ 50, especially footnote 126.

Not only is this theory in conflict with earlier portions of the Recommended Decision,[51] it is in conflict with earlier Commission orders. Previously, the Joint Board and the Commission have been clear that the purpose of the existing program of cost-based support methodology is to achieve reasonably comparable *net costs* for states with high preexisting costs. For example, in the *Seventh Report and Order*, the Commission said:

> By providing support for costs in any state that exceed a benchmark level, the Joint Board's recommended methodology ensures that the *cost levels net of support that must be recovered through intrastate rates -- and, by analogy, its assumed rate levels* -- must substantially exceed the national average. By taking account of the cost levels that must be supported in each state in order to enable reasonable comparability of rates, the Joint Board's *methodology ensures that federal support is targeted to areas where it is necessary to achieve its intended purpose -- enabling reasonable comparability of rates* -- and also that overall support levels are no higher than necessary to achieve this goal. We agree with the Joint Board that this methodology will result in federal support levels for each state that are appropriate to achieve the statutory principle of reasonable comparability of rates.[52]

But a supplemental support mechanism based on rates cannot cure defects in a cost-based support program that provides insufficient support. If the Commission continues to use costs as the principal basis for support, then it must design that support so that it complies with the statute. A supplemental rates-based system is just that, a supplement, not a cure.

The Joint Board wants it both ways. When it calculates support, it wishes to say that rates equal costs; but when it comes time for a Court to evaluate the results, it also wishes to say that rates do not necessarily equal costs. This is not permitted by law. If the Commission chooses to calculate support based on costs, it must also demonstrate that the calculations

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[51] See Recommended Decision, ¶¶ 18-20 (agrees with the Commission's past decision that cost analysis offers advantages over rate analysis for purposes of determining federal support levels).

[52] *Seventh Report and Order* ¶ 33 (emphasis added).

underlying that support are likely to produce reasonably comparable net costs between high cost states and urban areas of the nation.

The Joint Board's new theory is also overbroad and invites abuse. If the "final rate results" of federal support is the only way to evaluate the Commission's programs, the Commission gains practically unlimited discretion over high-cost activities. It may calculate and distribute cost-based support any way it chooses. It may alter or abandon cost models, set and adjust benchmarks, redesign the basic support calculation, even end cost-based support entirely, all without direct or immediate consequences.

A "final rates results" test is nothing less than an invitation to provide insufficient support. Even if the Commission were to arbitrarily end high-cost support entirely, no state could complain immediately. Until the decision actually flowed through to local rate increases, nothing could be done.[53] Even then, the most that would happen is that a state could file a petition seeking more support. The Commission could keep such a petition under advisement for months or years. This is not what Congress intended in 1996 when it enacted section 254.

The Commission cannot have it both ways. If "rates equal costs" for support, then "rates equal costs" for accountability. If the primary vehicle for support is cost-based, the Commission must design that system so that, as it explained in the *Seventh Order*, *"cost levels net of support"* in rural areas are reasonably comparable to urban areas. The Commission should reaffirm its own duty to provide sufficient support for states with high average *costs*.

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[53] In many states the process of increasing local rates takes many months. In Vermont, for example, rate increases typically take seven months.

B. The *Qwest* Court Did Not Invite the Use of Rates As The Only Test of Sufficiency.

The Joint Board stated that the "The Court criticized the Commission for failing to adequately reconcile its conclusion that rates were generally comparable in light of instances where state rates were reportedly high."[54] But when the *Qwest* decision is read as a whole, it is clear that the Joint Board has misunderstood the Court's intention. The Court never meant to suggest that it would be satisfied merely by a "final rates results" test. Indeed, this is contrary to the second of the Court's four main holdings. Having established a cost-based support system, the Court held that the Commission must relate the elements of *that system* to the statutory terms reasonable comparability and sufficiency. The Court's mandate is still the central problem in this proceeding, and one that has not been solved by the supplemental rates-based support mechanism.

It is true that the Court used the word "rates" at least once where "costs" would have made more sense. However, the Joint Board erroneously reads this language as license to use rates as the sole yardstick for the comparability standard. The Joint Board reads the language too broadly, when the Court clearly was loosely interchanging "rates" and "costs," much as the Joint Board itself has over the years.

For example, the Court erroneously reported that Montana and Vermont claimed that the Commission's existing system produced a 70-80 percent difference in "rates." Vermont and Montana had actually submitted information, first to the Commission and then later to the Court, that under the 135 percent benchmark rural *costs* would be 70-80 percent higher than urban

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[54] Recommended Decision ¶ 51.

costs.[55] It seems almost certain that the Court, in accepting the FCC's equating rates with costs, used the word "rates" as a substitute for "costs" when describing the Vermont and Montana information.

Of course, it was entirely natural to say "rates" instead of "costs" since the Commission has repeatedly encouraged this substitution. For example, in the *Seventh Report and Order*, the FCC noted once again the equivalence of costs and rates. It noted that the current universal service methodology, ultimately adopted in the Ninth Report and Order:

> uses costs as an indicator of a state's ability to maintain reasonable comparability of rates within the state and relative to other states. We conclude that the underlying assumption in the Joint Board's recommendation -- that a relationship exists between high costs and high rates -- is a sound one, because rates are generally based on costs. We adopt this approach, in part, because states possess broad discretion in developing local rate designs.[56]

Certainly in the context of this and similar statements it is understandable that the Court may have written "rates" when it meant "costs."

C. The Commission Cannot Condition Federal Support on State Commissions Filing Petitions.

The Joint Board's proposed supplemental support system requires states to apply for support. The Joint Board would give the Commission no duty to go out and collect meaningful data regarding final rate results. Instead, the burden would shift to high-cost states themselves. Effectively, the Joint Board recommends that the Commission presume that it has provided sufficient support, until a state proves otherwise. A high-cost state must carry the burden of proof concerning rate non-comparability. It not only must show that inadequate support has

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[55] Similar information, updated with current model runs, is submitted below.

[56] *Seventh Report and Order*, ¶ 32.

produced non-comparable rates, but that the state has taken "all actions reasonably possible and used all available state and federal resources to make basic service rates reasonably comparable."[57]

In enacting section 254, Congress did not intend that states be required to convince the Commission that the Commission's own cost-based support has been insufficient. Under the best of circumstances it is difficult to convince any person, FCC Commissioner or otherwise, that his or her past decisions have not been lawful. In this case it will be particularly difficult to establish that the Commission's past decisions on support have not provided sufficient support. Beyond this, states may have their own valid reasons for not filing petitions. If, for any reason, a high-cost state is unable or unwilling to file, that state's citizens could continue to have high average costs and rates.

Nothing in the Act endows the Commission with power to withhold sufficient support from such states because they are not willing to undertake initiation of a quasi-judicial proceeding in which it must carry the burden of proof. The Commission should state clearly that its own duty of providing sufficient support is not conditioned on state commissions filing applications for supplemental support.

D. The Joint Board Improperly Suggests that the Commission Has No Duty to Equalize State-to-State Cost Differences for a State That Has Not Equalized Internal Rate Differences.

The Joint Board recommended that supplemental support be denied unless the petitioning state has taken "all actions reasonably possible and used all available state and federal resources

[57] Recommended Decision ¶ 50.

to make basic service rates reasonably comparable."[58] The Commission should state that federal support is not conditioned upon the actions that a state takes within its own borders regarding local exchange rates.

The heading for this portion of the Recommended Decision is "Reasonable Comparability and State Inducements." The reference to inducements may have been intended to suggest that the addition of this new discretionary rates-based process somehow complies with the mandates of the statute and the Court regarding the FCC's duty to provide sufficient support for states to achieve reasonably comparable rates. The Rural State Commissions disagree.

The *Qwest* Court directed the Commission to consider creating incentives to encourage the states to carry out their own section 254 responsibilities. But nothing in the Court's decision suggests that if a state allegedly fails to respond to the inducement and fails to equalize rates within its own borders, the Commission's own responsibilities for state-to-state equalization will disappear. The Joint Board twisted the Court's language beyond recognition. The Court never intended its inducement language to shield the FCC from its own duty.

The fundamental distinction is between state-to-state rate and cost differences and in-state rate and cost differences. We illustrate the difference with two sets of examples. The first set consists of three states (A, B and C) with identical cost structures but with different rate design policies. States A, B and C each has a large low-cost area that serves 99 percent of its customers. But, each state also has a high-cost low-density area serving the one percent of its customers who are very costly to serve.[59] As a result, all three states have low average costs and low rates. Rate policies in the three states differ. In state A customers pay a single average

[58] Recommended Decision ¶ 50.

[59] State A might, in an exaggerated way, have a cost structure similar to some western states like Nevada that are highly urbanized but that also have extensive low-population-density areas and average costs that are modest.

tariffed rate. State B de-averaged its retail rates such that customers in high-cost areas pay a high rate of $100 per month. While state C also de-averaged its rates it also established a universal service fund that fully equalizes final average consumer bill. Table 2 summarizes these assumptions.[60]

Table 2.

State	Region	Lines	Costs		Rates			
		(000)	Cost per line	State Total / Average Cost (000)	Tariff Rate	Universal Service Charge	Universal Service Credit	Total Consumer Bill
A	Urban Area	9,900	$10.00	$99,000	$10.90	$0	$0	$10.90
A	Rural Area	100	$100.00	$10,000	$10.90	$0	$0	$10.90
A	State average	10,000	$10.90	$109,000	N/A	$0	$0	$10.90
B	Urban Area	9,900	$10.00	$99,000	$10.00	$0	$0	$10
B	Rural Area	100	$100.00	$10,000	$100.00	$0	$0	$100
B	State average	10,000	$10.90	$109,000	N/A	$0	$0	$10.90
C	Urban Area	9,900	$10.00	$99,000	$10.00	$.90	$0	$10.90
C	Rural Area	100	$100.00	$10,000	$100.00	$.90	- $90.00	$10.90
C	State average	10,000	$10.90	$109,000	N/A	$0	$0	$10.90

Two things are noteworthy in Table 2. First, in each state the average cost and the average bill is the same, $10.90 per month. Given the Commission policy to base support on state average costs, none of the three needs federal support, and any universal service need must be met internally.

Second, states A and C have similar net consumer bills, although they have adopted different rate policies. In state A, low-cost areas provide implicit support to the high-cost area, in the traditional form of rate averaging. In state C the same transfer is made, but explicitly through a state universal service fund. In states A and C all customers have a final net cost of

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60 We assume for simplicity, although it is not generally true, that rates in these states are set equal to the costs that are measured using the cost model.

$10.90. State B has de-averaged its rates, but it has not established a universal service fund. (State B is included here for clarity, although no state is likely to behave in this way.) In state B, rates are not reasonably comparable since urban customers pay $10 while rural customers pay $100.

In Table 3 we consider a second example involving states X, Y and Z. Again, all three states have the same cost structures. These three states have differing rate policies; State X has averaged rates, Y has de-averaged its rates, and Z has both de-averaged and established an explicit universal service fund.[61] But, in these three states the low-cost urban areas are much smaller and, as a result, the average customer bill in each state is higher. Once again, some customers in the middle state (here state Y) pay a rate of $100 per month.

Table 3.

State	Region	Lines	Costs		Rates			
		(000)	Costs per line	State Total / Average Cost (000)	Tariff Rate	Universal Service Charge	Universal Service Credit	Total Consumer Bill
X	Urban Area	100	$10	$1,000	$55	$0	$0	$55
X	Rural Area	100	$100	$10,000	$55	$0	$0	$55
X	State average	200	$55	$11,000	N/A	$0	$0	$55
Y	Urban Area	100	$10	$1,000	$10	$0	$0	$10
Y	Rural Area	100	$100	$10,000	$100	$0	$0	$100
Y	State average	200	$55	$11,000	N/A	$0	$0	$55
Z	Urban Area	100	$10	$1,000	$10	$45	$0	$55
Z	Rural Area	100	$100	$10,000	$100	$45	$-90	$55
Z	State average	200	$55	$11,000	N/A	$45	$0	$55

In Table 3 the average bill in all three states are high. Because each state has only 100,000 low-cost customers (unlike states A, B and C that each has 9.9 million), average consumer bills in both X, Y and Z must be large ($55 per month instead of $10.90). State X

[61] State Z might, in an exaggerated way, resemble Wyoming or Maine, which have taken significant action to deaverage rates and to establish state high cost funds.

achieves reasonably comparable rates through rate averaging, and state Z relies on an explicit support program. But the demographics always drive the economics. In state Z, the universal service charge must be $45 per month (instead of $0.90 in state C), and total consumer cost is still $55 per month.

In State Y, the rates are the same as in state B from Table 2: some customers pay $10 and others pay $100.[62] But, in state Y the demographics are the same as in states X and Z, and the average consumer cost in state Y is $55, just like states X and Z. Even if state Y were to equalize rates in its own borders it could only achieve net costs similar to state X or state Z, of $55 per month.

All three states, X, Y, and Z have an average final consumer cost of $55 per line per month. This is so high that neither X, Y, or Z can, by itself, achieve a final consumer cost that is reasonably comparable to urban areas of the nation. And, in states X and Y there is a serious risk of creating an incentive for uneconomic bypass.

These three states illustrate the problems with the Joint Board's recommendation. Although the intrastate details differ in states X, Y and Z, federal support is essential in all three. The Recommended Decision fails to recognize this critical fact and confuses intrastate rate differences (such as among X, Y and Z) and differences between high-cost and low-cost states (such as between C and Z). Accordingly, the Joint Board fails to differentiate between what states can achieve on their own and what is beyond their grasp.

State Y illustrates the fundamental problem. The Joint Board recommended that states must take "all actions reasonably possible and used all available state and federal resources to make basic service rates reasonably comparable." Although the Joint Board has not fully explained the meaning of this phrase, the extreme facts concerning state Y show that Y reasonably can do more for its customers, some of whom pay $100 per month while others pay $10 per month.

Nevertheless, the Rural State Commissions contend that denying an application from state Y would violate both the Act and the *Qwest* decision. Even though rates differ greatly within state Y, under the assumed facts, state Y has an average carrier cost and average consumer cost of $55 per month. When costs and rates are that high the Commission has an obligation to provide support. Federal support will still benefit Y's customers; at the very least, it would reduce the rates of those customers who are now paying $100 per month. The Commission may not withhold support from state Y until it redesigns its intrastate rates or establishes a universal service fund satisfactory to the Commission.

State X's situation is a more disturbing variation of the same problem. State X also has high costs and rates, but it has equalized consumer cost through approving tariffs that describe equalized rates. While the Recommended Decision is unclear, the Joint Board may mean to suggest that the Commission should deny State X's application because, by relying on "implicit" transfers, state X has not taken all actions required of it under section 254. The Commission may not withhold support from a high-cost state until that state replaces implicit transfers within explicit transfers.

The Commission cannot operate a rates-based federal support program and then deny support to a state with high average costs and rates on the ground that the Commission does not like the state's local exchange rate designs. Section 254 contains no such authority. Imposing such a condition not only withholds sufficient support, but it also intrudes on the jurisdiction

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[62] Once again, we note that it is highly unlikely that a state would take the step of de-averaging rates without also

reserved to the states over intrastate rates.[63] The Commission should state clearly that federal support is not conditioned upon state commission action to equalize local exchange rates within its own borders.

E. If There Is To Be a Rates-Based Support Mechanism, the Commission Should Clarify How To Measure Rates.

The Joint Board's recommendation fails to provide state applicants with guidance on a variety of key methodological issues.

- Most significantly, local calling areas vary considerably from state to state, and sometimes even within a single state. Where local calling areas are small, local rates may be low, but the average bill for short-haul intrastate toll calls can be larger than the local exchange charge.
- Some states have intentionally set high toll and access rates in order to have lower local exchange rates.
- In many states consumers have a choice of local calling plans. Sometimes these plans extend local calling to an "extended service" area that is larger than the local calling area available for the base plan.

If the Commission adopts a rates-based supplemental support mechanism, it should not leave states to their own devices on a case-by-case basis to find ways to reflect these differences. Instead, the Commission should issue some advance guidance about how the states may adjust or normalize rates for these important differences. Without such advance guidance, states will be likely to struggle for years to develop acceptable petitions that will produce predictable results.

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creating a state universal service support fund.

[63] *See* 47 U.S.C. § 152(b).

V. THE NATIONAL URBAN COST IS $17.89.

Despite the availability of cost data, the Joint Board did not even attempt to estimate a national average urban cost. Rural State Commissions describe below several approaches to estimating this number. All are based on cost data from the latest output of the Commission's own forward-looking cost model. Having considered the results from all these approaches, our best estimate is that the forward-looking cost of urban areas in the country is $17.89 per line per month.

A. Area Comparison Method -- $17.89

The Rural State Commissions have developed a new and comprehensive method for estimating urban cost. First, to define urban areas, we relied on definitions and data developed and recently published by the United States Bureau of the Census.[64] From a separate source we then obtained computerized boundary files for each wire center.[65] Using "geographic information system" software, we determined for each wire center the percentage of its area that the Census Bureau has characterized as "urban." We then excluded a wire center if its area is not at least 50 percent urban. The resulting list of wire centers contains only those that are predominantly urban on a geographic basis. Finally, we produced a weighted average of the forward-looking cost of these urban wire centers. The result is $17.89 per line per month.

The selection of 50% as the defining threshold for urban districts was appropriate. It resulted in 2,545 wire centers being classified as "urban," or 23 percent of the total of 11,118 wire centers identified in the Commission's cost model. The urban sample also included 96 million lines, which is 59 percent of the 163 million lines served by nonrural carriers. We could

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[64] According to the United States Bureau of the Census, urban areas include both "urbanized areas" and "urban clusters."

easily have selected a more selective standard for defining urban (and one that produced a lower estimate of average urban cost). But in the interest of being reasonable, we have selected a criterion under which nearly three of every five lines served by large carriers are considered "urban" lines.

The area comparison method has several advantages over other methods. First, it defines "urban" in the manner chosen by an expert government agency, the United States Bureau of the Census. Second, the method is the most comprehensive. It includes all wire centers operated by nonrural carriers that are predominantly urban. Third, there is a bias in the method, but it should be only slight. That bias arises from the fact that many of the wire centers considered "urban" have substantial portion of their area that are not "urban." This produces an upward bias on the average cost. However, the bias is probably smaller than in the other methods described below. Overall, we consider this method produces the most reliable of all estimates of average urban cost.

B. Urban Study Areas -- $16.03

Another, much simpler, way to estimate urban cost is to use the cost of all study areas that are largely or purely urban. Unfortunately, only one nonrural study area qualifies as entirely urban, Washington D.C. The forward-looking cost of providing service in Washington D.C. is $16.03.[66]

The Rural State Commissions considered including some other study areas, but even some obvious other candidates failed to qualify. All other nonrural study areas include substantial suburban and, more important, high-cost rural areas. For example, Rochester

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[65] We acquired from a commercial source a national database that shows the boundaries of all wire centers.

[66] USAC Quarterly report for 2002 Q4 table HC12.

Telephone serves extensive rural areas south of the city of Rochester, almost to the Pennsylvania Border. Likewise, Cincinnati Bell includes some rural areas in Kentucky. Including these study areas in the sample would bias the estimate upwards by including costs of rural areas in the "urban" estimate.

This method, because it considers only the cost in Washington D.C., may underestimate average urban cost. Washington D.C. has some unusual characteristics because of the dominance of the federal government and its unusual communications needs. These can be expected to reduce the average cost per line.

C. Wire Center Size -- $18.36

A third way to identify urban wire centers would be to select only those wire centers that serve large numbers of customers. In suburban and rural areas, the cost of long loops makes large switches uneconomic. For rural areas, the most economic method of providing service is with smaller switches and shorter loops. As a result, wire centers with large line counts usually are urban.

We considered wire centers with 25,000 lines or more to be "urban." 2,222 wire centers meet this criterion, amounting to 20 percent of the 11,118 wire centers in the nonrural carrier data set. This subset of wire centers serves 111 million lines, or about two-thirds of the 163 million lines served by nonrural carriers. The average weighted cost for this urban subset of wire centers is $18.36.

This estimate probably has some upward bias because it probably includes some geographically large urban wire centers that serve both an urban core and sizeable surrounding high-cost rural areas. This would tend to increase the resulting average urban cost under this method.

D. Density Zone Analysis -- $17.83

A fourth way to estimate national average urban cost is to take the average cost of all wire centers with sufficient line density. For other purposes, the Joint Board recommended a working definition of "urban" as wire centers with 540 lines or more per square mile.[67] This undoubtedly includes many suburban and rural areas, because it considers 66 percent of all access lines to be "urban."[68] Nevertheless, although it too includes an upward bias on urban average cost, we have used this same threshold for our calculation. As shown in Table 4, the resulting estimate of urban cost is $17.83 per line per month.

Table 4.

Density Zone	Number of Wire Centers	Number of Access Lines	Avg. Monthly Cost per Line	Monthly Cost
540 – 2550	1,859	62,995,615	$18.91	$1,191,247,079.65
2550 – 5000	481	24,086,299	$17.08	$411,393,986.92
5000 – 10000	204	12,559,720	$16.44	$206,481,796.80
>10000	114	8,811,891	$14.20	$125,128,852.20
Total		108,453,525		$1,934,251,715.57
Average			$17.83	

E. Summary

Table 5 summarizes the results from the four methods described above. All use costs derived under the Commission's forward-looking model.

Table 5.

Method	Urban Cost Estimate
Area Comparison at 50 percent +	$17.89
Urban Study Area	$16.03
Wire Center Size @ 25,000 +	$18.36
Density Zone @ 540 lpsm +	$17.83

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[67] Recommended Decision ¶ 50.

[68] 108 million of the total of 163 million lines served are characterized as urban.

The methods produce a fairly narrow range, from $16.03 to $18.36. The lowest estimate, $16.03, is based on the urban study area method that, as we noted, has a downward bias. All three of the other methods include suburban and rural area in the urban sample, and in varying degrees have an upward bias. The area comparison method should produce the most reliable estimate because it identifies most carefully those wire centers that are truly urban and thereby minimizes this upward bias. Its resulting estimate of urban average cost, $17.89, is in the middle part of the range, and it is only a few pennies above the density zone estimate. We recommend that the Commission set urban cost at $17.89 per line per month, the exact result of the area overlap method.

VI. THE COMMISSION SHOULD DEFINE REASONABLE COMPARABILITY AS "NOT MORE THAN A 25 PERCENT DIFFERENCE."

When Congress required the Commission to ensure that rates in rural and high cost areas are "reasonably comparable" to those in urban areas, it did not define the term, and it left the task to the Commission. While the Commission has some discretion to set the comparability standard for its cost-based support, in our view the Act permits net cost differences only within a fairly narrow range. We reach this conclusion based on an examination of legal precedent and by applying our knowledge of consumer behavior.

One approach to defining urban is to adopt a more precise verbal formula. The Commission tried this approach in the *Ninth Order,* but the Appeals Court disapproved of this technique because it did not in the end "illuminate the dispute."[69] It seems that a numerical

[69] The FCC had previously defined reasonably comparable rates as comprising "a fair range of urban/rural rates both within a state's borders, and among states nationwide," for example, *Qwest v. FCC*, 258 F.3d 1191, 1201 (10th Cir. 2001).

standard is required, and only this will allow a Court a meaningful opportunity to review whether support is sufficient.

The intent of Congress in enacting Section 254 may be illuminated by prior judicial decisions from other legal contexts. Generally, the Courts have applied the term narrowly, although they have not generally offered a precise quantitative definition. One case suggests that a synonym for "reasonably comparable' is "roughly equivalent."[70] Likewise, in cases involving property taxation, the parameters are sometimes very narrow as to what may be considered a "reasonably comparable" property.[71]

What is "comparable" also can be seen through the eyes of the consumer. One possibility is to define a numerical standard for "reasonably comparable" by using actual consumer judgments about material price differences. The concept is that two rates are not "comparable" if a suitably defined customer with a choice is not indifferent and considers the price difference materially different. In this way the decisions made by urban customers with a choice of providers can inform the scope of the benefits delivered by section 254 to rural customers who don't have access to those urban rates. Of course, the Commission would still need in the end to adopt a numerical definition for reasonably comparable, but this behavioral stepping stone offers the Commission an opportunity to inform its policy with empirical research and to tie it to the reality of consumer behavior.

Using this method, rates for two telecommunications services of equal quality might be defined as "comparable" when the services are provided in an effectively competitive market, and when a price-conscious consumer who is actively shopping for a service and who has good

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[70] *Dartmouth Review v. Dartmouth College,* 889 F.2d 13,19 (1st Cir. 1989).

[71] See, e.g., *Wisconsin v. City of Madison,* 178 Wis.2d 577 (1993).

information about price would be largely indifferent. Conversely, if rates are not comparable, a price-conscious and actively shopping consumer will nearly always choose the lower rate.

The "reasonably comparable" standard is less exacting than a "comparable" standard, and it therefore tolerates a somewhat greater rate disparity. In the context of consumer behavior, this definitional difference could be translated into altered assumptions about the consumer. Rates for two services should be considered "reasonably comparable" if most ordinary (i.e.: less active and less informed) consumers would be indifferent. Conversely, if rates are not reasonably comparable, an average consumer with average knowledge would quite likely choose the carrier offering the lower rate.

This allows a wide range of commercial experience to inform the standard. Gasoline prices offer an analogy from common experience.[72] The price variation at one time within a single locality in Montana or Vermont typically is less than 10 percent. Thus based on our observations of customer behavior, when gasoline is selling at an average price of $1.30, a difference of $0.13 would cause most customers to seek out the lower price, even if it means discarding one's accustomed merchant.[73] Thus for gasoline, two prices that differ by more than 10 percent are not reasonably comparable.

For the present analysis, the relevant market is local exchange rates. Rates for universal service of equal quality therefore should be defined as "reasonably comparable" when the services are provided in an effectively competitive market,[74] and when an average consumer (who is not actively shopping for a service and who has average information about price) would

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[72] The analogy is necessarily simplified because gasoline is a less complex product than local exchange services.

[73] Some customers would be much more price sensitive.

[74] "Effective competition" in this context is a demanding concept that generally requires at least five competitors dividing the market into equal shares. Shepherd, William G., *Anti-Competitive Impacts of Secret Strategic Pricing in the Electricity Industry*, Public Utilities Fortnightly, Vol. 135(4), February 15, 1997, pp. 24-29.

often be indifferent. The Rural State Commissions assert that two local exchange rates that are within 25 percent of each other probably meet this test, and therefore may be considered "reasonably comparable." Accordingly, the Commission should define rural costs as reasonably comparable if they are not more than 125 percent of the average urban cost.

VII. THE JOINT BOARD DID NOT RECOMMEND A BENCHMARK CONSISTENT WITH LAW.

The Joint Board recommended continuation of the current benchmark of 135percent, which translates to a dollar benchmark of $29.61 (= 135percent x $21.93). Given our recommendation above that average urban cost is $17.89, this amounts to an "urban benchmark" (to use the Joint Board's phraseology) of 165.5 percent. That is, no state will receive support under the current system until its average cost exceeds the national average urban cost by at least 65 percent. This is only just short of the 70-80 percent that the Tenth Circuit warned the Commission was probably not "reasonably comparable."

In other words, if the Commission adopts the Joint Board's recommendation, it is continuing a system very similar to one for which the Tenth Circuit has already said that it "doubt[s] that the statutory principle of 'reasonabl[e] comparab[ility]' can be stretched that far." The Rural State Commissions contend that it cannot be stretched to 65.5 percent either.

The Commission should reject the Joint Board's recommendation and establish a new benchmark that meets the statutory test. That benchmark should be no higher than 125 percent of the national average urban cost, or $22.36. This will ensure that no state will have net costs, after federal support, more than 25percent higher than the costs characteristic in urban areas. [75]

There are many ways to express a benchmark of $22.36. The Commission might elect, as it has in the past, to state the benchmark as a multiple of the national average cost. In that case, the benchmark would be equal to:

$22.36 / $21.93 = 102 percent.

In other words, if the Commission persists in defining the benchmark as a multiple of national average cost, it should select a benchmark no higher than 102 percent. The effect of such a benchmark is to provide some federal support to all states that have costs more than two percent above the national average.

[75] All else equal, this benchmark would require support for nonrural carriers, exclusive of hold-harmless support, of $1.7 billion. The amount of support thus required would be reasonably comparable to the amount currently provided to "rural telephone companies" who receive loop and switching support for intrastate costs and who serve a minority of rural customers nationwide. That rural company support is approximately $1.4 billion.

Respectfully submitted,

_____s/ Martin Jacobson_____________
Martin Jacobson, Esq., for
Montana Public Service Commission
1701 Prospect Avenue
PO Box 202601
Helena, Montana 59620-2601

_____s/ Peter Bluhm_____________________
Peter Bluhm, Esq., for
Vermont Public Service Board
112 State Street, Drawer 20
Montpelier, Vermont 05620-2701

____s/ John Sayles______________________
John Sayles Esq., for
Vermont Department of Public Service
112 State Street
Montpelier, Vermont 05602

_____s/ Mary Wright____________________
Mary Wright, Esq.
616 Helena Avenue
Helena, Montana 59620-1703
For the Montana Consumer Counsel

ATTACHMENT: STATEMENT OF DR. WILLIAM GILLIS.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of Federal-State Joint Board on Universal Service	CC Docket No. 96-45

Statement of Dr. William Gillis

Now comes William Gillis and states as follows:

1. I hold a Ph.D degree in Agricultural Economics from the University of Wisconsin. I have over 20 years experience in public sector economics including in-depth work analyzing both existing and alternative federal universal service mechanisms. My work has included substantial emphasis in analyzing the assumptions and parameters of alternative universal service costing methodologies in the context Section 254 of the Telecommunications Act. My economic analysis and that conducted under my direction has been relied upon by both state and federal public decision makers in evaluating appropriate reforms to high cost universal service mechanisms.
2. I served as a Commissioner on the Washington Utilities and Transportation Commission from 1994 to 2000. I also served as Chairman of the Rural Task Force that reported to the Federal-State Joint Board on Universal Service.
3. I am familiar with the purposes of universal service support under Section 254 of the Telecommunications Act of 1996 and with the purposes of the programs that the Federal Communications Commission now operates under that statute.

4. I have reviewed the Recommended Decision of the Joint Board on Universal Service that is the subject of Public Notice, DA 02-2976.
5. The Joint Board recommended continuation of the existing system of support for nonrural carriers, including continuation of the existing benchmark for support that is set at 135 percent of national average cost, as determined by the Commission's forward-looking cost model.
6. The Joint Board offered several reasons to explain its conclusion that the 135 percent benchmark should be retained. One of those reasons was "standard deviation analysis." Under that analysis, the Joint Board concluded that the dollar value of the benchmark should be approximately equal to the sum of the mean forward-looking cost among nonrural carriers plus two standard deviations.
7. Standard deviation analysis is a tool used in statistical hypothesis testing. Hypothesis testing and standard deviation analysis are the right tools for certain types of problems, such as deciding whether the mean value of a sample is significantly different from the mean value of a population or whether two samples may derive from the same population. In instances where data are normally distributed, there is a definite relationship between the number of standard deviations between two means and a confidence level. For example, if a sample mean differs from the population mean by more than two standard deviations, then it is acceptable, to say that the means are statistically different, with a "confidence level" of 95% . This means that in a large number of cases where we conclude that there is a significant difference (and the "null hypothesis" is false), we would expect our conclusion to be correct 95 percent of the time and incorrect 5 percent of the time.
8. This kind of statistical inference is also in common use by regulatory agencies that must evaluate the relative quality of wholesale services provided by incumbent telephone

companies. I note, for example, that the Commission has approved the 95 percent confidence interval in evaluating the sensitivity of Verizon's performance measures of when it is providing wholesale services to its competitors.[76] This kind of analysis is also standard practice within the scientific and economic communities.

9. The issue presently before the Commission, however, is not a problem for which hypothesis testing and standard deviation analysis is appropriate. In applying standard deviation analysis via a 95 percent confidence interval, the Joint Board has inappropriately applied the science of statistical inference.

10. Under some circumstances standard deviation analysis may be appropriate, but a different confidence interval may be proper. In those cases, one should not use two standard deviations as the test criterion. The appropriate confidence interval depends upon the risks and benefits of false positive errors and false negative errors. For example, if a drug has severe side effects, the FDA might want to require a 99 percent confidence level of the drug's effectiveness before allowing it to reach the market. Conversely, if a diagnostic test is cheap, reliable and harmless, it may be appropriate to administer the test to a broad population even though there is only a 1 percent confidence level that a particular individual receiving the test is actually ill.

11. As I previously stated, the preceding analysis assumes that the Commission's forward-looking cost data are "normally distributed." I am not aware of any analysis by the Joint Board or the

[76] Application by Verizon New England Inc. for Authorization To Provide In-Region InterLATA Services in Vermont, CC Docket No. 02-7, Order released April 17, 2002, footnote 267.

Commission supporting the proposition that the levels are normally distributed. Indeed, there exists credible analysis showing that the data are skewed to the right.[77]

12. In regulatory applications, I am familiar with a previous occasion where, under different circumstances, the Commission has deemed appropriate the use of 1.0 standard deviation, not the 2.0 recommended here by the Joint Board.[78] It should not be surprising that in some applications 1.0 standard deviation is appropriate and in others 2.0 standard deviations is appropriate. Different circumstances call for different standards of confidence. But the Joint Board's analysis did not explain clearly why 2.0 standard deviations is the appropriate test here. The Commission should not assume that 2.0 standard deviations is an unvarying scientific norm. One, two and three standard deviations each has an associated confidence level, and each has been used by the scientific community.

13. Statisticians and other analysts also sometimes use standard deviation analysis for a different purpose, to reject measured but suspect raw data. Under this procedure, one may measure something but then discard data points that are more than two or three standard deviations from the mean. The underlying assumption is that the discarded data points probably reflect errors of unexplained origin. In this context analysts sometimes speak of "outlying data," or more simply of "outliers." This kind of analysis is standard practice in the scientific and economic communities. But once again, this scientific use of standard deviations has nothing in common with the problem here, deciding when rural costs are reasonably comparable to urban costs.

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[77] This analysis is included in the comments of the Montana and Vermont Commissions, to which I understand this statement will be attached.

[78] In analyzing the reasonableness of collocation costs, the FCC found in 1997 that 1.0 standard deviations provided sufficient confidence. *In the Matter of Local Exchange Carriers' Rates, Terms, and Conditions for*

14. I am not aware of any other basis on which in the present context “standard deviation analysis” or the use of a point defined by two standard deviations above the mean of the cost population would have any statistical or scientific validity.

15. The Commission also must define when two costs are “reasonably comparable.” This does not require a sophisticated intellectual endeavor involving either hypothesis testing or standard deviation analysis. Unless “reasonably comparable” is defined, any benchmark established is arbitrary. It does not make any difference whether that benchmark is expressed as a percentage or as a number of standard deviations from the mean. Both are equally arbitrary. One need only observe that customers often make rational choices based on rate comparisons. Modest price differences in similar products or services are observed to induce rational consumers to select the lower priced product. For example, consider the price sensitivity of a rational consumer in choosing among alternative suppliers of automobile gas. Any station that attempts, to sell gas at a price 35 percent above a neighboring gas station’s price will soon go out of business. The Joint Board’s Decision to presume 135 percent benchmark results in comparable costs is not consistent with real world observations of how rational consumers make choices. Consequently, statistical observed clustering of costs around the defined benchmark is not an appropriate use of inference to define comparable costs. Under many circumstances, consumers require a price difference smaller than 35 percent before they consider two prices to be reasonably comparable.

I hereby assert that the preceding statements and opinions are true and accurate. I offer these opinions understanding that one or more State Commissions may file them before the FCC

Expanded Interconnection Through Physical Collocation for Special Access and Switched Transport, CC Docket No. 93-162, Second Report and Order, released June 13, 1997 ¶ 125.

in the above-captioned proceeding. I have not received any compensation in return for offering these opinions or for executing this statement.

December 18, 2002

Wm R. Gillis

____

Dr. William Gillis, Ph.D.
Center to Bridge the Digital Divide
Washington State University
223 Hulbert Hall, PO Box 646229
Pullman WA 99164-6229
Phone: 509-335-7038